METHOD FOR MANUFACTURING A SCOURING BODY

[0001] The present invention relates to a method for manufacturing a scouring body, a hardenable binder being applied to a material web made from textile material, and the material web being subsequently guided through at least one heating zone for at least one thermal hardening process, and the material web being provided with surface embossing in an embossing process by thermal molding.

[0002] Such scouring bodies have working surfaces profiled by embossing and are in particular suitable and provided for cleaning and scouring processes. The scouring bodies may be connected to a support which may be another textile formation, a foam body, or a plastic body.

[0003] A binder is usually applied to a material web made of textile material for manufacturing these scouring bodies. The material web is then guided through a heating zone, where the binder hardens. The binder may be applied on one side or on both sides. The material web may be guided through a plurality of heating zones, the binder being first partially and subsequently fully hardened.

[0004] The embossing process by thermal molding for profiling the surface has previously been carried out subsequently to the final hardening of the binder (EP 0 696 432 B1). The embossing process may be carried out in a continuous process directly following the final hardening of the binder, but embossing may also be carried out in a separate machine.

[0005] In particular when thermally hardening binder systems are used, thermal molding carried out after hardening for the purpose of embossing results in embrittlement, damage, and therefore weakening of the material. This damage is caused mostly by mechanical and/or thermal stresses in the binder. Therefore, the products obtained by this manufacturing process often do not resist the stresses occurring when they are used as cleaning or scouring bodies.

[0006] The object of the present invention is therefore to provide a method of the type named in the preamble in which damage to or a negative effect on the binder due to the thermal embossing process is ruled out or at least minimized.

[0007] This object is achieved according to the present invention by carrying out thermal molding for the embossing process between the application of the binder and a final thermal hardening process resulting in the final hardening of the binder.

[0008] Damage to the product is thus prevented or at least largely minimized, which results in a product suitable for use as a cleaning or scouring body.

[0009] According to an advantageous embodiment of the invention, thermal molding for the embossing process is carried out directly before the final hardening process resulting in the final hardening of the binder.

[0010] If one or more partial thermal hardening processes precede the final thermal hardening process, thermal molding for the embossing process may be carried out before the partial hardening process or before one of the partial hardening processes.

[0011] Embossing may then take place via rolling, pressing, or punching.

[0012] The present invention is elucidated below in detail with reference to the exemplary embodiments illustrated in the drawing.

[0013] Figure 1 schematically shows a process sequence for manufacturing a material web for scouring bodies, and

[0014] Figure 2 shows a modified process sequence as illustrated in Figure 1.

[0015] A hardenable binder is applied to a material web 1 made from textile material, for example, polyamide fibers, at a first station 2. The binder may be applied by spraying, spreading, padding, or in a bath. The material web is subsequently continuously guided through a first heating zone 3, where the binder is partially hardened. Material web 1 then passes over a roller 4 and is turned over. At a second station 5, the binder is applied to the second side of material web 1.

[0016] The material web then passes through a second heating zone 6, where the binder applied at second station 5 is also partially hardened. The material web goes, via a roller, to an embossing station 8 only indicated in Figure 1, where the surface structure is embossed by thermal molding. Embossing may take place via rolling, pressing, or punching.

[0017] The embossed material web then passes into a third heating zone 9, where the final hardening of the binder is carried out in a final thermal hardening process.

[0018] In the exemplary embodiment illustrated in Figure 2, material web 1 made from textile fibers also passes through the three heating zones 3, 6, and 9 consecutively, the binder being applied as described, at stations 2 and 5.

[0019] The difference with respect to the previously described exemplary embodiment is that embossing of the surface is carried out at an embossing station 10 upstream from first heating zone 3, at an embossing station 11 between first heating zone 3 and second heating zone 6, or at an embossing station 12 directly upstream from second heating zone 6.

[0020] The common feature of the above-described exemplary embodiments is that thermal molding for the embossing process takes place between station 2, where the binder is first applied, and third heating zone 9, where the final hardening of the binder occurs via a final thermal hardening process. Thermal molding for the embossing process thus takes place in each case upstream from last heating zone 9, the embossing stations illustrated in the drawing being only possible examples of application so that further variants are also possible.

[0021] Heat is controlled in heating zones 3, 6, and 9 in such a way that the binder only hardens partially in heating zones 3 and 6, while final hardening occurs in last heating zone 9.

[0022] Examples of the binders used include phenolformaldehyde resins, acrylates, melamine resins, or polyurethanes.